July 20, 1948. E. E. GREENWELL 2,445,324

CONTOUR TRANSFER DEVICE

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Fig. 2

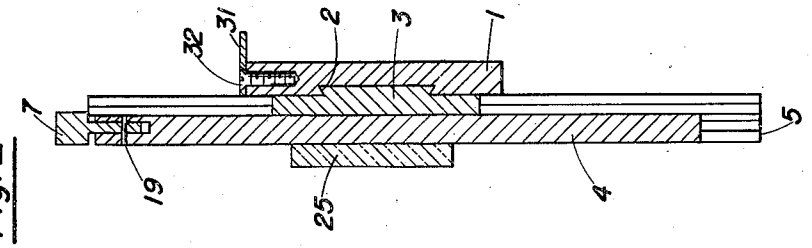
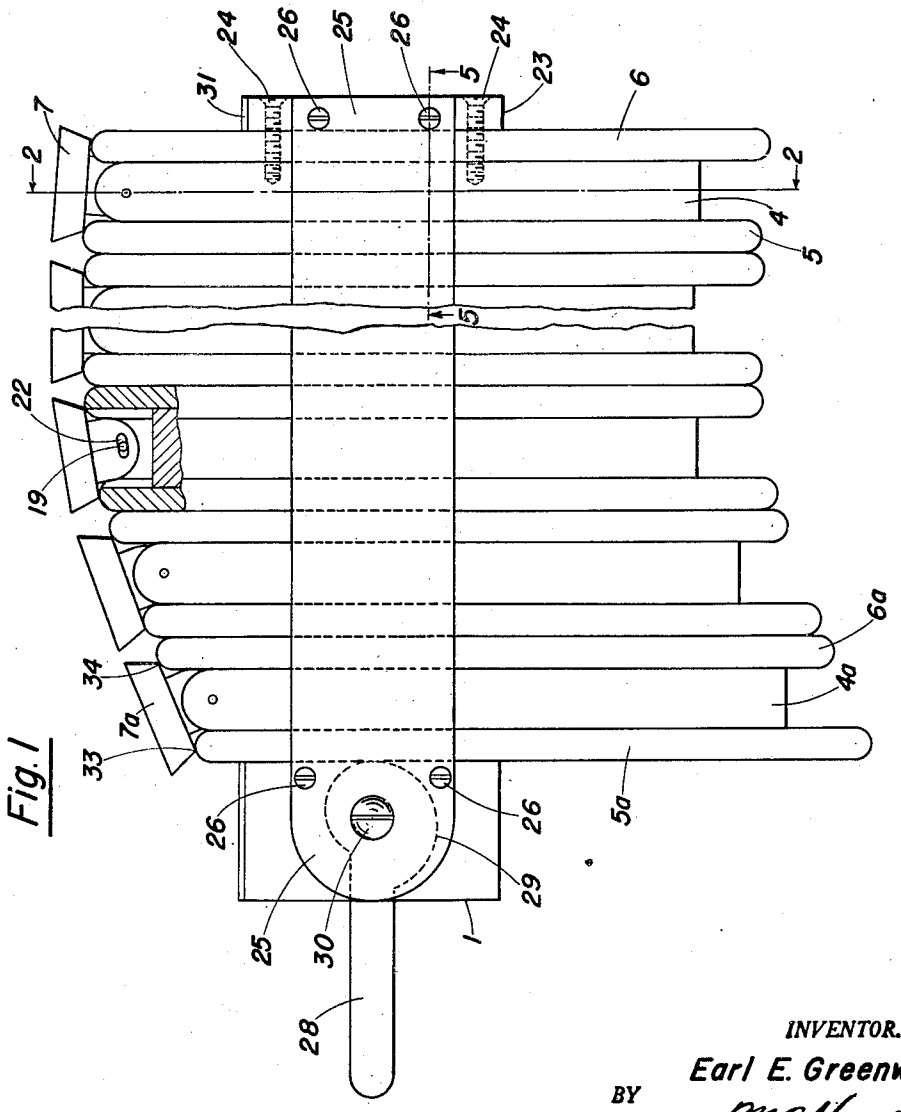


Fig. 1



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Fig. 3

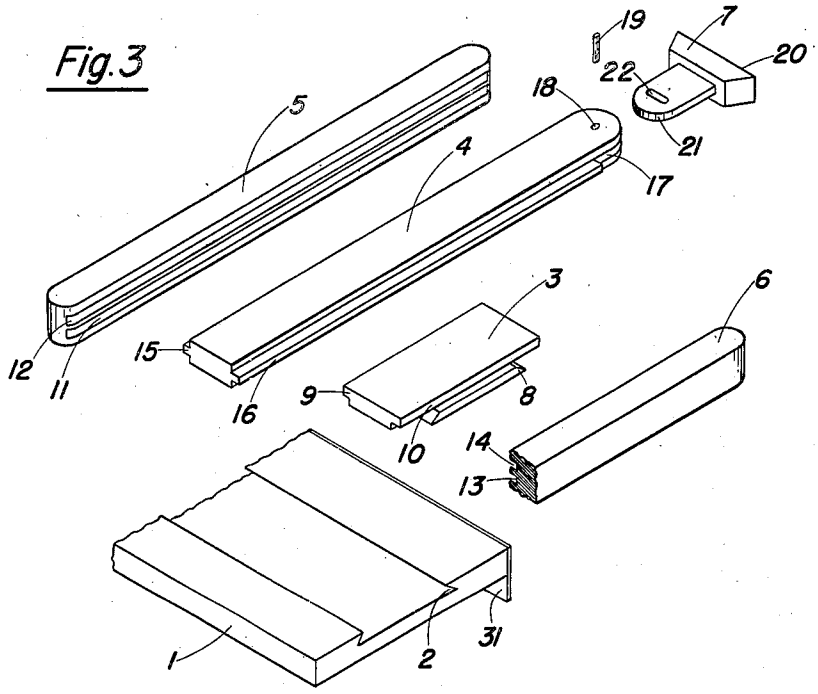


Fig. 4

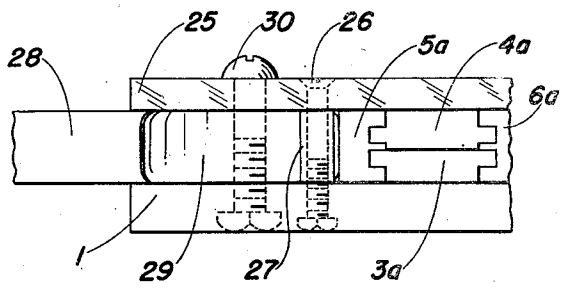
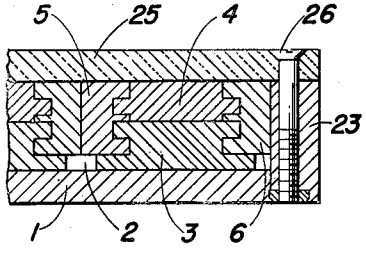


Fig. 5



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UNITED STATES PATENT OFFICE

2,445,324

CONTOUR TRANSFER DEVICE

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Application June 24, 1946, Serial No. 678,760

3 Claims. (Cl. 33—175)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This invention relates to a contour transfer device.

Objects of the invention are to provide a device for transferring or duplicating the contour of irregular surfaces especially those relating to propeller blades and to provide a contour transfer device which is simple in design and easy to manufacture and operate.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a plan view of a contour transfer device embodying the features of the present invention.

Fig. 2 is a cross section of the device of Fig. 1 taken along the lines 2—2.

Fig. 3 is an exploded view of one complete set of the elements of Fig. 1.

Fig. 4 is a fragmentary elevation of the device of Fig. 1; and

Fig. 5 is a cross section of the device of Fig. 1 taken along the lines 5—5.

Numeral 1 indicates a base member which may be made of metal, wood or any other suitable material. The member 1 has a dovetail type of slot or mortise 2 formed therein substantially along its entire length. Slidably mounted on the base are a plurality of contour transfer units, one of which is shown in Fig. 3, being composed of a carriage 3, a sliding beam 4, a pair of locking bars 5 and 6 and a contour shoe 7. The carriage 3 has a dovetail tenon 8 engageable with the mortise 2 in the base 1 and has two transversely extending tongues 9 and 10. The locking bar 5 is provided with two parallel longitudinal grooves 11 and 12 while the locking bar 6 is provided with identical grooves 13 and 14. The tongue 9 is slidably received in the groove 11 while the tongue 10 is slidably received in the groove 13. The sliding beam 4 lies atop the carriage 3 and is provided with tongues 15 and 16 on opposite sides thereof to be slidably received by the grooves 12 and 14 respectively when the device is assembled, as shown in Figs. 2, 4, and 5. The carriage 3 by its dovetail engagement with the base 1 and its tongue and groove engagement with the beam 4 constrains the beam 4 substantially to motion perpendicular to the longitudinal dimension of the base and thus prevents the beam 4 from becoming skew to the base 1 in which position it could not be locked. The beam 4 at its outer end is slotted as shown at 17 and pierced with an opening 18 through opposite walls of the

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slot to receive a pin 19. The contour shoe 7 is adapted to have its outer surface 20 engage a portion of the contour of any surface to be copied and is provided at its other end with a reduced rounded portion 21 adapted to fit within the slot 17. The portion 21 is provided with an elongated slot 22 through which the pin 19 extends when the device is assembled. In assembling the device a plurality of transfer units are mounted on the base by sliding the dovetail tenons 8 into the mortise 2. An end stop 23 fastened to the base by any suitable means such as screws 24 is provided to limit motion of the units in one direction. To prevent any undesired movement of the parts away from the base 1 a cover plate 25 of Lucite or other suitable material is attached at one end to the stop 23 and at its other end to the base 1 by means of screws 26. The screws 26 to the left in Fig. 1 are surrounded by spacers 27 which serve to space the cover plate 25 from the base 1. To lock all the units simultaneously a cam lock lever 28 is provided having a cam surface 29 adapted to engage the adjacent locking bar 5a. The lever 28 is pivotally connected to the base 1 by means of a bolt 30. A heel plate 31 is attached to one side of the base by any suitable means such as screws 32. The heel plate 31 is adapted to engage a fixed surface to serve as a reference plane from which the adjustable members extend when the device is in use.

Operation

To use the device the cam lever 28 is rotated clockwise as viewed in Fig. 1 thus releasing the pressure on the adjacent locking bar 5a and on all the transfer units. The device is now placed on a table or other suitable surface with the heel plate 31 in contact with some fixed portion to establish a reference line and the various sliding beams represented by the numeral 4 are pushed toward the object such as a propeller blade, whose contour is to be transferred, until each of the contour shoes represented by the numeral 7 is in engagement with the adjacent portion of the object. The individual shoes can be pivoted about the loose pivotal connection formed by the slot 22 and the pin 19 so as to provide a close fit against the outline of the propeller blade. As each shoe is placed in its final position it is held there by sliding the pairs of locking bars represented by the numerals 5 and 6 until they engage the shoe at points such as 33 and 34 respectively on opposite sides of the pivot axis thus preventing motion of the shoe relative to the beam 4. After all locking bars have been

set they are simultaneously locking by rotating the lever 28 counterclockwise as viewed in Fig. 1 so that the cam surface 29 engaging the adjacent edge of the locking bar 5a forces each of the units against its neighbor by contralateral pressure of the entire group against the end piece 23. This pressure provides sufficient friction to prevent the beams 4 or the locking bars 5 and 6 from moving. The entire device may now be lifted from the propeller blade or other object and the contour described by the plurality of shoes 7 will be a close duplication of the surface of the object. The device may now be used as a template to test the accuracy of a proposed reproduction of the object or may be used as a guide for drawing a copy of the surface.

It is apparent that the base 1 may be made as long as desired for large objects with a proportionately increased number of contour transfer units. Also, the size of the contour shoes 7 may be made as small as desired to more closely approach the exact curve of any surface to be copied by the simple expedient of correspondingly decreasing the size of other parts of each unit.

While I have shown but one embodiment of my invention, it is apparent that the device is susceptible to modification without departing from the spirit of the invention. I do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A contour transfer device comprising a base having a groove formed therein; a plurality of transfer units mounted adjacent each other on said base; each unit including a carriage having a tenon portion for engagement with the groove in said base, and having a tongue on each of two opposite sides thereof; a locking bar having a pair of parallel grooves, the first of which grooves slidably engages one of said tongues; a second locking bar having a pair of grooves, the first of which grooves slidably engage the other of said tongues; a beam having tongues on the opposite sides thereof in slidable engagement with the second said grooves of said pairs in said locking bars; a contour shoe loosely pivoted to said beam adjacent one end thereof, the ends of said locking bars being adapted for contact with said shoe on either side of its pivotal connection to lock said shoe in position; stop means adjacent one end of said base to limit movement

of said units along the groove in said base; a cover plate fixed to said base to prevent displacement of said units away from said base; and a locking cam pivoted to said base adjacent the end of said base opposite said stop means for locking said plurality of units against said stop means.

2. A contour transfer device comprising a base having a mortise formed therein; a plurality of transfer units mounted adjacent each other on said base; each unit including a carriage having a tenon portion for slidable engagement with said mortise, and having a pair of parallel tongues on opposite sides thereof extending transversely relative to said tenon portion; a first locking bar having a pair of parallel grooves on one side thereof, one of which grooves slidably receives one of said tongues on said carriage; a second locking bar having a pair of parallel grooves, one of which slidably receives the other of said tongues on said carriage; a sliding beam overlying said carriage and having a pair of parallel tongues on opposite sides thereof slidably received in the other grooves of said pairs of grooves in said bars; a contour shoe loosely pivoted to said beam adjacent one end thereof; a cover plate overlying said units and fixed to said base; stop means adjacent one end of said base for limiting movement of said units, a cam lock pivotally mounted on said base adjacent the other end thereof for locking said units in position against said stop means.

3. A contour transfer device comprising a base, a plurality of beams adjustably mounted relative to the base, contour shoes carried by the beams and adjustable relative thereto, means to hold said contour shoes in adjusted position relative to said beams, and means for simultaneously locking said beams and said holding means to render said contour shoes immovable relative to said base.

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